

# Mid-Way Map Routing

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**Abstract:** *Optimized route planning is an important factor in contemporary transportation, logistics, and navigation systems. This study introduces a web-based multi-stop route optimization system that computes the shortest and most efficient route from three user-specified locations: a starting point, a midpoint, and a destination point. The system utilizes Dijkstra's Algorithm, one of the most popular graph-based shortest path algorithms, to compute the best route with the shortest travel distance. The planned system incorporates a Flask-based backend for handling location data and calculating the shortest route through a pre-defined graph visualization of routes. The JavaScript-based frontend with Leaflet.js has an interactive map visualization of the calculated route. The system further estimates travel times across various transportation modes such as walking, car, bus, motorbike, and train, and allows users to make informed decisions regarding travel. The study assesses the performance of the algorithm as a function of computed paths compared to other routing strategies and measures efficiency both in terms of computation time and accuracy. The system finds possible applications in urban transit planning, logistics, and delivery organizations and can provide a realistic solution to real-time navigation and route optimization.*

**Keywords:** Route optimization, Dijkstra's Algorithm, shortest path, Flask, navigation, multi-stop routing

